

IN THE CLAIMS

1. (currently amended) A data processing apparatus for ~~executing reproducing~~ of data from a memory device or for recording ~~of data~~ into a memory device, the recording or reproducing ordinarily being carried out on condition that a mutual authentication between said data processing apparatus and ~~said the~~ memory device is established successful, said data processing apparatus comprising:

a virtual memory device;

a structure operable to execute ~~said the~~ mutual authentication with said virtual memory device when ~~said the~~ memory device cannot function to does not include a structure operable to execute ~~said the~~ mutual authentication; and

a structure operable to ~~executing said reproduction~~ of data from ~~said the~~ memory device or ~~said recording of data into said the~~ memory device ~~on condition that when the~~ mutual authentication between said data processing apparatus and with said virtual memory device is successful established.

2. (currently amended) The data processing apparatus according to Claim 1, further comprising a structure operable to first execute ~~the~~ mutual authentication with ~~said the~~ memory device when ~~said mutual authentication is available by initially checking whether said the~~ memory device is capable of includes the structure operable to execute ~~said the~~ mutual authentication or not.

3. (currently amended) The data processing apparatus according to Claim 1, further comprising:

a key for authenticating distribution of an enabling key block, said key having been previously enciphered by ~~such the~~ enabling key block, the enabling key block containing enciphering data for enciphering renewal keys

which are located on various paths constituting of a hierarchical key tree structure, comprising the hierarchical tree structure having a variety plurality of keys disposed in correspondence associated with tree various roots of the tree structure, nodes of the tree structure, and leaves of the tree structure, on whereby a given one of the plurality of paths of the key structure extends ranging from a specific one of the roots to a particular one of the leaves of said key tree structure, the leaves of the tree structure being respectively associated with corresponding to a plurality of data processing apparatuses as own leaves, said the enciphering data further comprising including upper-rank keys in said tree hierarchy which are to be enciphered by lower-rank keys; and

said the mutual authentication executed between said structure of said data processing apparatus and said virtual memory device being is executed by applying said enabling key block distribution authenticating key and another authenticating key previously stored in said virtual memory device.

4. (currently amended) The data processing apparatus according to Claim 3, wherein

only a properly licensed said data processing apparatus is able enabled to decode said enabling key block only when properly licensed, whereas a data processing apparatus devoid of a proper license and is unable to decode said the enabling key block when devoid of a proper license in a plurality of data processing apparatuses jointly constituting leaves of said key tree structure; and

said data processing apparatus preventing such data processing apparatus devoid of a the proper license being prevented from illegally implementing mutual authentication

with said virtual memory device by revoking said improper data processing apparatus.

5. (currently amended) The data processing apparatus according to Claim 3, further comprising means for subjecting said enabling key block distribution authenticating key ~~enciphered and presented by said enabling key block~~ to a version controlling process by ~~way of~~ executing a process for renewing individual versions.

6. (currently amended) The data processing apparatus according to Claim 1, further comprising:

a key tree structure comprising a ~~variety~~ plurality of keys ~~disposed in correspondence associated with various roots of the tree structure, nodes of the tree structure, and leaves of the tree structure, on and having a plurality of paths whereby a given one of the paths extends ranging from a specific one of the roots to a particular one of the leaves of said the key tree structure,~~ a plurality of data processing apparatuses being respectively associated with the leaves of the tree as own leaves,

means for enciphering leaf-keys ~~provided in correspondence associated with own the leaves with using a storage key that is proper to an individual ones of said data processing apparatuses and then storing the enciphered leaf-key in a memory means inside of the within a~~ corresponding data processing apparatus.

7. (currently amended) The data processing apparatus according to Claim 1, further comprising:

a key tree structure comprising a ~~variety~~ plurality of keys ~~disposed in correspondence respectively associated with various roots of the tree structure, nodes of the tree structure, and leaves of the tree structure, on and having a plurality of paths that extend ranging from the roots to the leaves of said key tree structure, there being a~~

plurality of data processing apparatuses respectively corresponding to ~~own the leaves of the tree, based on and~~ to leaf-keys provided in that further correspondence with ~~own the leaves,~~

a device key block stored in a memory within the processing apparatus, the key block being an assemblage of ciphered keys comprising mutually different individually enciphered node keys of plural steps ~~ranging extending from~~ own the leaves of the tree structure up to upper-rank keys of ~~said the~~ key tree structure.

8. (currently amended) A data processing method for ~~executing reproducing of~~ data from a memory device or ~~for~~ recording ~~of~~ data into ~~said the~~ memory device, said data processing method comprising ~~the steps of~~:

executing ~~a mutual authentication process~~ with a virtual memory device provided in ~~said a~~ data processing apparatus when ~~said the~~ memory device does not include a ~~is devoid of a function to execute said mutual authentication function;~~ and

~~executing reproducing of the~~ data from ~~said the~~ memory device or recording ~~of the~~ data into ~~said the~~ memory device on conditioned ~~on said that the~~ mutual authentication being ~~actually effectuated between said the~~ data processing apparatus and ~~said the~~ virtual memory device is successful.

9. (currently amended) The data processing method according to Claim 8, further comprising ~~the steps of~~:

identifying, prior to said executing step, whether ~~said the~~ memory device is capable of executing said mutual authentication; and

alternatively executing a mutual authentication between ~~said the~~ data processing apparatus and ~~said the~~

memory device when execution of said mutual authentication between them is possible.

10. (currently amended) The data processing method according to Claim 8, wherein

~~said the~~ data processing apparatus ~~comprises~~ includes an enabling key block distribution authenticating key previously enciphered by an enabling key block, the enabling key block including ~~containing~~ data for enciphering renewal keys that are located on a path ~~which is part of~~ a key tree structure having ~~with a variety~~ plurality of keys respectively disposed in ~~correspondence~~ associated with various roots of the tree structure, nodes of the tree structure, and leaves of the tree structure, ~~on the paths ranging extending from the roots to the leaves of~~ said key tree structure, a plurality of data processing apparatuses respectively associated with ~~corresponding to~~ ~~own the~~ leaves, ~~said the~~ enciphering key also including data for enciphering upper-rank keys via lower-rank keys;

said mutual authentication process ~~executed between~~ ~~said the~~ data processing apparatus and ~~said the~~ virtual memory device being executed by applying ~~said the~~ enabling key block distribution authenticating key and the other authenticating key previously stored in ~~said the~~ virtual memory device.

11. (currently amended) A license system for providing a data processing apparatus ~~system with a proper license control~~, comprising:

means for providing an enabling key block distribution authenticating key, the enabling key block distribution authenticating key being previously enciphered by an enabling key block containing data for enciphering renewal keys located on paths ~~constituting of~~ a key tree structure, ~~comprising the key structure having a variety~~ plurality of

~~keys disposed in correspondence associated with various~~
~~roots of the key tree structure, nodes of the key tree~~
~~structure, and leaves of the tree structure, on a whereby a~~
~~given one of the plurality of paths ranging extends from a~~
~~specific one of the roots to a particular one of the leaves~~
~~of said the key tree structure, a plurality of data~~
~~processing apparatuses corresponding to own being~~
~~associated with the leaves, said the enabling key block~~
also comprising data for enciphering upper-rank keys via
lower-rank keys;

a virtual memory device;

means for ~~executing a process for reproducing data~~
from a memory device or recording data into ~~said the~~ memory
device on ~~conditioned on whether a that~~ mutual
authentication is ~~actually successfully~~ effectuated between
said data processing apparatus and ~~said the~~ memory device,
~~even or when said the memory device is devoid of a function~~
does not include means for carrying out the mutual
authentication, by making use of said virtual memory device
~~when said memory device is incapable of mutual~~
~~authentication, to execute on condition that mutual~~
authentication is successfully effectuated between with
said data processing apparatus and said virtual memory
device; and

means for enabling only a properly licensed data
processing apparatus to ~~properly decode said the~~ enabling
key block that providesing said the enabling key block
distribution authenticating key among ~~a the~~ plurality of
data processing apparatuses, ~~for constituting said key tree~~
~~structure and means for preventing such an data processing~~
apparatus devoid of ~~a the~~ proper license from illegally
decoding ~~said the~~ enabling key block, thereby preventing
~~said improper the~~ data processing apparatus devoid of the

proper license from illegally effectuating authentication with said virtual memory device ~~to further prevent said improper data processing apparatus from and~~ illegally utilizing contents data.

12. (currently amended) A ~~program~~ providing computer-readable medium ~~which provides a computer system with a specific computer program for executing a method of reproducing~~ of data from a memory device or recording of data into a the memory device, said ~~computer program method~~ comprising:

~~a module executing a mutual authentication between a data processing apparatus and a virtual memory device provided in a corresponding data processing apparatus when the memory device does not include a is devoid of a function to execute mutual authentication function;~~ and

~~a module executing reproducing of data from said the memory device or recording of data into said the memory device conditioned upon said the mutual authentication being actually successfully effectuated between said the data processing apparatus and said virtual memory device.~~

13. (currently amended) A data processing apparatus for recording data to, or reproducing data from, a memory device, the apparatus comprising:

a controller; and

a virtual memory;

wherein the recording of the data to, or reproducing of the data from, the memory device is conditioned upon the successful establishment of a mutual authentication between the controller and the virtual memory when the memory device does not support such mutual authentication.

14. (currently amended) The data processing apparatus of claim 13, wherein prior to performing the mutual authentication

between the controller and the virtual memory, the controller ~~checks if~~ determines whether the memory device includes the ~~supports mutual authentication function,~~ and, if so, the recording of ~~the data to,~~ or reproducing ~~of the data from,~~ the memory device is conditioned upon ~~the establishment of the~~ successful mutual authentication between the controller and the memory device.

15. (currently amended) The data processing apparatus of claim 13, wherein the mutual authentication ~~is performed between~~ the controller and the virtual memory is carried out by applying an authenticating key stored in the virtual memory and an enabling key block distribution authenticating key, wherein the enabling key block distribution authenticating key is previously enciphered by an enabling key block comprising enciphering data for enciphering renewal keys, ~~on the renewal keys being located~~ along paths of a hierarchical key tree structure comprising in ~~which a variety plurality of keys are associated disposed in~~ correspondence with various roots of the key structure, nodes of the key structure, and leaves of the key tree structure, whereby a given one of the plurality of on-paths ranging extends from a specific one of the roots to a particular one of the leaves of the key tree structure, ~~and wherein the data processing apparatus is being associated with one of the leaves of the key tree structure, and wherein said enciphering data further comprises including upper-rank keys to be enciphered by lower-rank keys.~~

16. (currently amended) The data processing apparatus according to claim 15, wherein the data processing apparatus is properly licensed if the data processing apparatus is enabled to decode the enabling key block, ~~and wherein the data processing apparatus is devoid of proper licensing if~~ the data processing apparatus is unable to decode the enabling key block.

17. (currently amended) The data processing apparatus according to claim 15, wherein the enciphered enabling key block distribution authenticating key ~~enciphered by the enabling key block~~ is subject to a version controlling process or to executing a process for renewing individual versions on the controller.

18. (currently amended) The data processing apparatus according to claim 13, further comprising a memory for storing an enciphered leaf key, the enciphered leaf key being produced by enciphering a leaf key with a storage key that is associated with the data processing apparatus, the leaf key being a part of a hierarchical key tree structure ~~having comprising a variety~~ plurality of keys disposed in correspondence respectively associated with various roots of the tree structure, nodes of the tree structure, and leaves of the key tree structure, whereby a given one of the plurality of ~~en~~-paths extends ranging from a specific one of the roots to a particular one of the leaves of the key tree structure, and wherein the leaf key is associated with the data processing apparatus.

19. (currently amended) The data processing apparatus according to claim 13, further comprising a memory for storing a device key block comprising an ~~assemblage~~-plurality of ciphered keys further comprising that include mutually different individually enciphered node keys of a hierarchical key tree structure ~~having comprising a variety~~-plurality of keys disposed in correspondence respectively associated with various roots of the key structure, nodes of the key structure, and leaves of the key tree structure, and having a plurality of en-paths whereby a given one of the paths ranging extends from a given one of the roots to a particular one of the leaves of the key tree structure, and wherein one of the leaves is associated with the data processing apparatus.

20. (currently amended) ~~A method for use i~~In a device for recording data to, or reproducing data from, a memory device, ~~the a method comprising the steps of:~~

(a) ~~executing a mutual authentication process with a virtual memory device when the memory device does not include a support the mutual authentication function process; and~~

(b) if the mutual authentication between the device and the virtual memory device is successful, executing the recording of the data to, or the ~~reproducing~~tion of the data from, the memory device.

21. (currently amended) The method of claim 20, further ~~comprising the steps of:~~

~~(c) prior to step (a), identifying whether the memory device supports includes the mutual authentication function process; and~~

~~(d) if the memory device supports includes the mutual authentication function process, skipping step (a) and executing the mutual authentication process function with the memory device in place of step (a) for the purpose of recording data to, or reproducing data from, the memory device.~~

22. (currently amended) The method of claim 20, wherein the mutual authentication process ~~is executed~~ between the device and the virtual memory is carried out by applying an authenticating key stored in the virtual memory ~~and together with an enabling key block distribution authenticating key, wherein the enabling key block distribution authenticating key is being previously enciphered by an enabling key block comprising that includes enciphering data for enciphering renewal keys located along~~ on paths of a hierarchical key tree structure having comprising a variety plurality of keys disposed in correspondence respectively associated with various roots of

the tree structure, nodes of the tree structure, and leaves of the key tree structure, whereby a given one of the plurality of
en-paths extends ranging from a specific one of the roots to a
particular one of the leaves of the key tree structure, and
wherein the device is being associated with one of the leaves of
the key tree structure, and wherein said the enciphering data
including further comprises upper-rank keys that are to be
enciphered by lower-rank keys.

23. (currently amended) ~~A license system for use in a data processing system, the license system comprising:~~

means for providing an enabling key block distribution
authenticating key ~~having been previously enciphered by an~~
enabling key block, the enabling key block including
~~comprising enciphering data for enciphering renewal keys~~
that are located along en-paths of a hierarchical key tree
structure comprising having a variety plurality of keys
disposed in correspondence respectively associated with
roots of the key structure, nodes of the key structure, and
leaves of the key tree structure, en-whereby a given one of
the plurality of paths extends ranging from a specific one
of the roots to a particular one of the leaves of the key
tree structure, and wherein at least one of the leaves of
the key tree structure is being associated with a device
data processing apparatus, and said enciphering data
~~further including comprising upper-rank keys that are to be~~
enciphered by lower-rank keys;

a virtual memory device;

means for ~~executing a process for reproducing data~~
~~from, or recording data to, a memory device on conditioned~~
that en-whether a mutual authentication is actually
effectuated between the device data processing apparatus
and the virtual memory device is successful when the memory
device does not include means for is devoid of a function

~~to executing the~~ mutual authentication with the ~~device~~
data processing apparatus; and

the data processing apparatus device being properly
licensed if ~~the device is~~ enabled to decode the enabling
key block and ~~the device being~~ devoid of proper licensing
if unable to decode the enabling key block.

24. (currently amended) A computer-readable medium for
storing computer-executable software code for carrying out a
method of recording of data to, or the reproducingtion of data
from, a memory device, said ~~code~~ method comprising:

~~code for~~ executing a mutual authentication ~~process~~
with a virtual memory device when the memory device does
not include a support the mutual authentication function
~~process~~; and

~~code for~~ ~~executing the~~ recording of the data to, or
~~the reproducingtion of~~ the data from, the memory device if
~~the~~ if the mutual authentication ~~between the device and~~
with the virtual memory device is successful.